

REMARKS

I. Introduction

Claims 1 to 12 are pending in the present application, all of which have been rejected. In view of the remarks submitted in the response of July 23, 2009 and the following remarks and attached declaration under 37 C.F.R. 1.132 in this supplemental response, applicants respectfully submit that the claims are now in condition for allowance.

II. Rejections of Claims Under 35 U.S.C. § 103

Claims 1-8, 11, and 12 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,384,155 (“Van Swieten et al.”) as evidenced by the Akzo-Nobel product data sheets for Trigonox EHP and Trigonox 187 and as further evidenced by the Remarks filed by applicant on April 13, 2009 . Claim 9 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Van Swieten et al. in view of U.S. Patent No. 6,274,690 (“Hoshida et al.”). Claim 10 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Van Swieten et al. Applicant respectfully submits that these rejections should be withdrawn for at least the following reasons.

The Office Action asserts that Van Swieten et al. discloses a suspension polymerization process of vinyl chloride using a first initiator and a second initiator which at the cited polymerization temperature of 57°C have a half life of 3.1 and 0.1 hours respectively. According to the Office Action the reference fails to disclose an “unsafe” reaction or a runaway polymerization and therefore the amount of initiators in Van Swieten et al inherently meets the “at most 90% of the safely useable amount” as in the present claims. Further the Office Action asserts that the cooling capacity of the method disclosed in Van Swieten et al. is inherent to the process. With respect to the requirement in the claimd

invention to add the second initiator at least partially between the start of the polymerization until 10% of the monomer has been polymerized, the Office Action states that the monomer conversion of 12% in the process disclosed by Van Swieten et al, as evidenced by applicant in the April 13, 2009 response, is in value close enough that the skilled artisan would have expected the same properties from the resulting reaction. According to the Office Action the skilled artisan would expect that adding an initiator at a different point in the reaction would lead to predictable changes in the polymer's properties, such as molecular weight, molecular weight distribution, and processability characteristics. Moreover the Office Action states that the point of commencement and the duration of the initiator feed are result effective variables because changing them will clearly affect the type of product obtained, including the polymer's physical properties. According to the Office Action discovery of an optimal value of a result effective variable in a known process is ordinarily within the skill of the art. With respect to the rejection of claim 9, the Office Action asserts that in view of Hoshida, disclosing polymerizing vinyl chloride monomer with reactors of at least 40 m³, it would have been obvious to the skilled artisan to have scaled up the process of Van Swieten et al. With respect to the rejection of claim 10 the Office Action asserts that while Van Swieten et al fails to specifically disclose variable dosing of the first initiator in a polymerization using two initiators, the cited reference teaches generally that the initiators may be dosed continuously. Therefore, it would have been obvious to the skilled artisan to modify the process in Van Swieten et al to arrive at the currently claimed invention.

As submitted in the response of July 23, 2009, applicant respectfully disagrees with these assertions for at least the following reasons. Further, with respect to the Example F in Van Swieten et al wherein vinyl chloride monomer is polymerized using 0.05 %w/w of Trigonox EHP-C70 and 0.01 %w/w of Trigonox 187-C30 the attached declaration is submitted under 37 C.F.R. 1.132 describing a repetition of the process described in Van

Swieten et al. As described therein, the dosing time was 2.5 hours after the start of the heat-up in 1 hour. Performance of Example F wherein the second initiator (Trigonox 187-C30) is dosed in 1 hour after 2.5 hours from the start of the polymerization shows that the second initiator is added after 12% of the monomer has been polymerized. Therefore, the second initiator in Example F of Van Swieten et al. is not “dosed at least partially from the start of the polymerization until 10% of the monomer(s) has been polymerized,” as is presently claimed in independent claim 1 from which dependent claims 2-12 all ultimately depend, and thus include this limitation as well. Thus, Van Swieten et al. does not disclose nor suggest the presently claimed invention considering that the cited reference fails to teach or suggest a second initiator “dosed at least partially from the start of the polymerization until 10% of the monomer(s) has been polymerized.

As submitted in the response of July 23, 2009, in contrast to the assertion in the Office Action that the difference between 12% and until 10% is a small change as well as the assertion that the currently claimed invention involves optimization of a result effective variable, the claimed invention provides a polymerization process wherein the heat of polymerization is better controlled compared to the process in the cited reference and which process is not taught or suggested in Van Swieten et al. According to the Office Action “a person of ordinary skill in the art would expect that adding an initiator at a different point in the reaction would lead to predictable changes in the polymer's properties, such as molecular weight, molecular weight distribution, and processability characteristics.”

However, the currently claimed invention is directed to better control the heat of polymerization and to keep the heat of polymerization at maximum cooling capacity while not changing the polymer properties. As such the currently claimed process in the present invention allows optimum reaction space-time yield, very efficient peroxide usage, and low residual peroxide levels in the resulting polymer. Accordingly, the presently claimed

invention provides an improvement in safety and economic efficiency and is not directed to changing polymer properties as suggested by the Office Action. Thus, where a skilled artisan would desire to produce a specific PVC grade (with a specific molecular weight, etc.) in a more efficient way; he or she does not want to change the grade.

Convinced that "changing the commencement and duration of the initiator feed are result effective variables because changing them will clearly affect the type of product obtained", it must be a surprising that the present process does not necessarily change the product obtained and therefore is non-obvious. The skilled artisan, reading Van Swieten and desiring to increase the initiator efficiency (that is: a process which requires less initiator) and use the maximum cooling capacity, would have no guidance from the cited reference on how to achieve this, let alone that such a skilled artisan would be inclined to achieve this by using at most 90 wt% of the safely usable amount of a first initiator, to dose the second initiator within the first 10% conversion and in an amount such that at least 92% of the maximum cooling capacity is used in this 10% conversion. Therefore, applicants respectfully submit that the presently claimed invention is not obvious in view of Van Swieten. Any other conclusion is based on impermissible hindsight.

In addition, as submitted in the response of July 23, 2009, Hoshida et al. fails to cure the shortcomings of Van Swieten et al. That is, Hoshida et al. fails to teach or suggest a second initiator "dosed at least partially from the start of the polymerization until 10% of the monomer(s) has been polymerized."

Therefore, none of the cited references, alone or in combination, teach or suggest the presently claimed process which includes a second initiator "dosed at least partially from the start of the polymerization until 10% of the monomer(s) has been polymerized." For at least the preceding reasons, it is respectfully submitted that the rejections under 35 U.S.C. §103(a) have been overcome and should therefore be withdrawn.

V. Conclusion

In view of the preceding remarks, it is respectfully submitted that the application is in condition for allowance and prompt consideration is respectfully requested.

Respectfully submitted,
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